

Appl. No. 10/801,818  
Amdt. dated October 12, 2005  
Reply to Office Action of August 11, 2005

### **REMARKS/ARGUMENTS**

Claims 1-24 remain in this application.

Claims 1 and 11 have been recast as "methods of casting". This amendment is supported throughout the specification, for example, the detailed description. Claims 1 and 11 have been amended to indicate that the mask has a plurality of perforations. This amendment is supported at paragraphs [0022] to [0025], for example. Claims 1 and 11 have been amended to indicate that the coating layer on the mould is divided into fragments as a result of spraying the coating material through the mask. This amendment is supported, for example, in paragraphs [0028] and [0049].

#### ***Claim Rejections – 35 USC § 102***

The Examiner has rejected claims 1, 4, 7-8, 10-12, 14-15, 20 and 23 under 35 USC 102(b) as being anticipated by Abbott et al. Applicant respectfully traverses having regard to the amended claims and the following comments.

In Abbott et al., the mask has a single large opening (see Fig. 1). The mask "defines an area of the surface to be coated" (see col. 2, line 39), which is the cavity of the mould and not the abutting surfaces of the mould (see Fig. 1). It is evident from col. 5, lines 48-67 that the mask is being used to prevent thermal-spray build-up between abutting surfaces of the two-part mould, which would be a problem for mould operation. This is consistent with the characterization of the mask in the specification and Figures.

Further, Abbott et al. teach that the "positioning system 26 can also manipulate the thermal spray system 24 so that the sprayed coating 28 can be deposited in a manner such that it has the desired thickness and desired location in the cavity 16" (see col. 5, line 48) without the mask. This alternative is also consistent with the desire to prevent the aforementioned thermal-spray build-up.

In contrast, the presently claimed invention recites a mask having a plurality of perforations that produce a coating layer on the mould that is divided into fragments. Such an arrangement provides a coating that is much less susceptible to spalling than thermal sprayed coatings of Abbott et al. The mask in Abbott et al. does not have a plurality of openings and does not produce a coating layer on the mould that is divided into fragments. Therefore, the present claims are not anticipated by Abbott et al.

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Further, in respect of claim 12, Applicant disagrees with the contention that a ceramic mould as recited in claim 12 is taught by Abbott et al. Plastic injection moulding, with which the Abbott et al. invention is concerned, is typically performed using metal moulds, not ceramic moulds.

Further, in respect of claim 20, the overlay of the coating material recited in claim 20 is not taught by Abbott et al.

Applicant respectfully requests that the objections be withdrawn.

### ***Claim Rejections – 35 USC § 103***

The Examiner has rejected claims 2, 3, 5-6, 9, 13, 16-19, 21-22 and 24 as being unpatentable over Abbott et al. in view of three other references. Applicant respectfully traverses having regard to the amended claims and the following comments.

The presently claimed invention recites a mask having a plurality of perforations that produce a coating layer on the mould that is divided into fragments. Such an arrangement provides a coating that is much less susceptible to spalling (see paragraph [0016]) than thermal sprayed coatings of the prior art, e.g. Abbott et al.

As indicated above, the mask in Abbott et al. has a single opening and is used only to prevent thermal-spray build-up between abutting surfaces of the two-part mould. There is no teaching or suggestion in Abbott et al. that the mask produces a coating layer that is divided into fragments. There is no teaching or suggestion that the coating layer is less susceptible to spalling, which, as the Applicant's specification teaches, is an advantage of the presently claimed method. In fact, since the mask has only a single opening, the thermal-spray coating of Abbott et al. will be an undivided layer susceptible to spalling in a manner similar to other prior art methods.

None of Turchan et al., Tselesin and JP '236 may be combined with Abbott et al. to arrive the presently claimed invention.

#### **Turchan et al.:**

The methods disclosed in Turchan et al. do not use a mask. In fact, Turchan et al. at col. 15, line 15, col. 30, lines 23-24 and col. 34, line 6 specifically teaches away from masking.

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**Tselesin:**

Tselesin teaches a method for making an abrasive material comprising a plurality of hard particles providing the abrasive quality distributed in a retaining matrix for holding the particles in place. The method comprises the steps of placing a mask having openings therein against a carrier capable of supporting a plurality of the particles, providing an affixing capability to an outer side of the mask remote from the carrier to which hard particles will adhere, applying a plurality of hard particles to the outer side of the mask so that a portion of the particles pass through the openings of the mask and form a pattern of the particles on the carrier corresponding to the openings of the mask and another portion of the particles adhere to the mask, separating the mask containing the hard particles adhered to it from the carrier leaving the pattern of the particles on the carrier, at least partially surrounding the particles on the carrier with a retaining matrix material, and heating the retaining matrix material to cause the material to form a retaining matrix that holds the particles in the pattern.

As has been previously mentioned, producing a coating layer that is divided into fragments on a mould provides a coating that is much less susceptible to spalling during a casting process. There is no teaching or suggestion in either Abbott et al. or Tselesin of this advantage. Tselesin is not at all concerned with a spalling problem since he does not even disclose a casting process. Thus, one skilled in the art would not even look to Tselesin to solve this problem.

Further, Tselesin teaches that hard particles are applied to a carrier through the mask and are held in place on the carrier by a retaining matrix. As taught at col. 5, lines 32-42, for example, "the hard particles are permanently (for the life of the hard particles in the abrasive tool) fixed or bonded in the retaining matrix and/or the carrier". Thus, Tselesin intends the hard particles to be irremovable from the carrier, which is in keeping with the stated use as an abrasive tool. This is unsuitable for the presently claimed method. In the present claims, the coating material sprayed on to the mould must be removable since, after the entire casting process is complete, the coating ends up as a surface layer on the casting. Therefore, the proposed combination of Abbott et al. and Tselesin is improper as it renders one or the other reference unsuitable for its intended purpose. See: *In re Fritch*, 972 F.2d 1260, 1265 n.12, 23 U.S.P.Q. 2d 1780, 1783 n. 12 (Fed. Cir. 1992). See also: MPEP § 2143.01.

Furthermore, Tselesin is in an unrelated field of technology (US class 51/293). There is no motive for a person skilled in the art of casting to look to this art for a solution to a problem relating to mould surfaces. Tselesin teaches embedding hard particles on a barrier to produce an abrasive tool. Tselesin does not teach or suggest a casting process in which a coating layer on a mould

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becomes a surface layer on a casting. In fact, any mention of coating in Tselesin is in relation to an adhesive layer that may be applied to the carrier (col. 5, lines 5-7), not to the hard particles.

The Office Action further asserts that it would be obvious to one having ordinary skill in the art to provide Abbott et al. the use of mask having a particular size and mesh as taught by Tselesin in order to effectively coat and treat the mould surface for better coating and casting function surface layers. However nothing in Tselesin or Abbott et al. would suggest their combination. There is no reason to believe that applying coating particles to a carrier as taught by Tselesin would in any way improve coating and casting functions of a mould, or that it wouldn't weaken the mould by applications of rollers etc. as shown in Fig. 10, or by sintering, or moulding the mould piece as described by Tselesin: "Providing a permanent retention between the hard particles and the carrier directly and/or through the retaining matrix material by various processes of heating, sintering, braising, fusing, moulding, casting, depositing (i.e., electrical or thermal depositing), plating, etc.; all with or without pressure, special atmospheres or vacuums; and any combinations thereof" (col. 5, line 36).

Further, Applicant further respectfully disagrees that Tselesin teaches placing the mask a fixed distance to the surface of the mould. Tselesin does not teach a mould surface, but in any case the teaching is of a mask placed directly on the surface of a carrier (see col. 4, lines 19-24 and col. 5, line 60, for example). The minimum 1 millimeter spacing recited in present claims 3 and 17 is used to ensure that the mask does not get fused to the cavity surface, as would likely happen if the mask were placed on the surface and a thermal spray were applied. Thus, Tselesin teaches directly away from claims 3 and 17.

Applicant further respectfully disagrees that Tselesin teaches leaving the perforated mask within the mould when the liquid casting material is introduced to the mould to thereby form a surface layer incorporating the mask, as recited in claims 9, and 24. Applicant finds no suggestion of this and finds that (col. 6, line 60), and Fig. 9 teach directly away from claims 9 and 24.

JP '236:

As amended, claims 1 and 11 of the present application recite a coating layer that is divided into fragments as a result of spraying the coating material through the mask. The cited JP '236 does not mention masking at all and cannot be combined with Abbott et al. to arrive at the claimed features.

Applicant submits that the claims are not obvious having regard to Abbott et al. in view of Turchan et al., Tselesin, JP '236 or any combination thereof. Applicant respectfully requests that the objections be withdrawn.

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**Conclusion**

In view of the above amendment and remarks, reconsideration on all claims is respectfully requested. In the event any matters remain to be resolved in view of this communication, the Examiner is encouraged to call the undersigned so that a prompt disposition of this application can be achieved. Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Respectfully submitted,

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